

# **ABSTRACT**

A universal modulator that accepts baseband audio and video inputs and converts the combined signal to one of a plurality of frequencies dependening upon a desired output frequency and broadcast standard. The universal modulator is coupled between  
5 baseband video and audio outputs of a settop terminal demodulator/decoder and an input of a television receiver. Configuration of the universal modulator is performed via manual input by settop terminal controls or interrogation directly by a CATV headend. A communication bus coupled to the firmware  
10 distributes addressable instructions to selectively control addressable PLL frequency synthesizers. The modulator also obviates oscillator difference beat frequencies that may manifest themselves since programmable PLL frequency synthesizers are used.